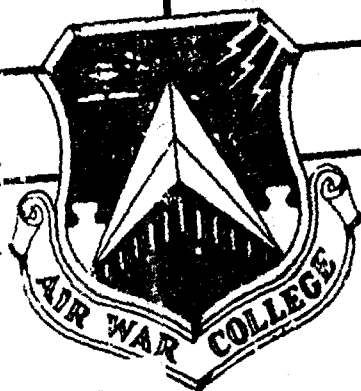


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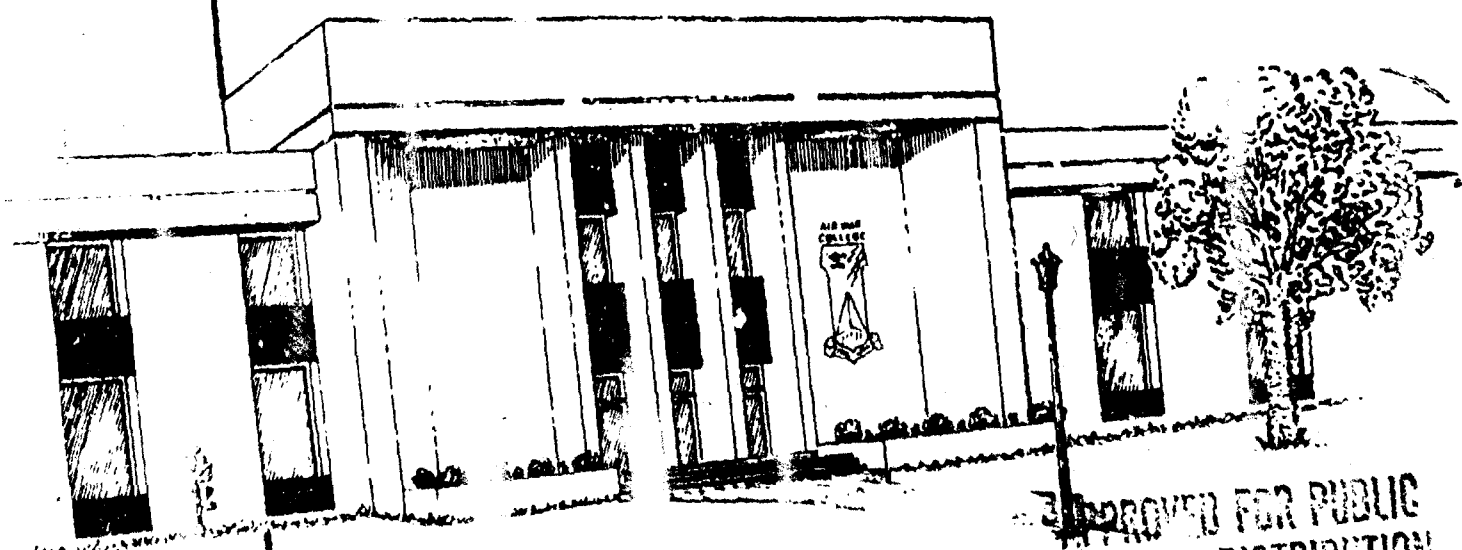
CHEMICAL WEAPONS TREATY:
PERSPECTIVES AND PROSPECTS

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CHEMICAL WEAPONS TREATY:
PERSPECTIVES AND PROSPECTS

by

Peter K. Raymore
Lieutenant Colonel, USAF

A RESEARCH REPORT SUBMITTED TO THE FACULTY
IN
FULFILLMENT OF THE RESEARCH
REQUIREMENT

Research Advisor: Dr. Robert A. Hoover

MAXWELL AIR FORCE BASE, ALABAMA

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AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: Chemical Weapons Treaty: Perspectives and Prospects

AUTHOR: Peter K. Raymore, Lieutenant Colonel, USAF

Remarks on some historical aspects of prohibiting chemical weapons introduce a discussion of current efforts towards a global chemical weapons ban. A review of past efforts to prohibit or control chemical weapons, the state of current negotiations, the problems in achieving a comprehensive, global, and effectively verifiable ban, and prospects for a treaty. An alternative approach is recommended.



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BIOGRAPHICAL SKETCH

Lieutenant Colonel Peter K. Raymore has been assigned to a variety of command and staff positions as an air weapons controller in the command, control, and communications arena. Interest in the chemical warfare area began as a unit commander and with continuing interest in the subject of arms control. Colonel Raymore is a graduate of the Air War College, class of 1988.

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CHAPTER I

INTRODUCTION

Prohibition of chemical weapons (CW), an historic goal, is being pursued in the international arena with renewed attention and incentive. The United Nations Conference on Disarmament (CD) in Geneva is the forum for current efforts to agree on a convention prohibiting production, stockpiling, and use of chemical weapons and assuring the destruction of existing stockpiles. The two key players in these negotiations are the United States and the Union of Soviet Socialist Republics. The US presented a draft convention in 1984 which called for a comprehensive, global, effectively verifiable ban on CW. After initial reluctance, in August 1987, the USSR expressed willingness (at least in principle) to accept key provisions of the draft convention. However, significant differences remain, primarily in the areas of security, verification, and the global scope of the treaty.

Chemical weapons, in various forms, beginning with the simplest forms of poisons, have been available to nations or combatant parties for hundreds of years. However, widespread use of these weapons, either because of general abhorrence of them or because of difficulties in employment

of them, occurred only during World War I. Subsequent uses have been limited to relatively isolated instances.

Although efforts to prohibit chemical weapons have a long history, results have been limited. Verification of a complete ban remains as the most formidable problem.

This paper will review both the history of efforts to control or prohibit chemical weapons and the historical problems that have hampered that effort. This paper will then address the state of current CW negotiations, the significant security and verification problems facing the negotiators, and the prospects for chemical arms control in this latest round.

CHAPTER II
BACKGROUND
HISTORY OF BIOLOGICAL AND CHEMICAL
WEAPONS CONVENTIONS

An excellent review of previous efforts to control biological and chemical weapons is contained in a book by Ann Van Wynen Thomas and A. J. Thomas, Jr.¹ A significant historical reference point from which to begin this review is the Declaration of St. Petersburg of 1868. The result of an international military commission, the declaration, while primarily forbidding the use of certain projectiles, such as dum-dum (exploding) bullets, also contained language that prohibited "the employment of arms which uselessly aggravate the sufferings of disabled men, or render their death inevitable."² The Conference of Brussels, in 1874, specifically forbade the "employment of poison or poisoned weapons," but this declaration was not adopted by the represented governments.³ These Conferences did, however, lead to the signing of the Hague Gas Declaration of 1899, which stated that the signatories would "abstain from the use of projectiles the sole object of which is the diffusion of asphyxiating or deleterious gases."⁴ The Hague Conference of 1907 added language forbidding the employment of poison or

poisoned weapons as well as forbidding employment of arms "calculated to cause unnecessary suffering."⁵

These conventions forbidding the use of gas or poisons did not deter Germany (and later other states) from employing chemical weapons in World War I, primarily an agent commonly called mustard gas. The Treaty of Versailles contained language prohibiting Germany from producing or using gas weapons.⁶ However, German possession of CW in World War II belied the effectiveness of these treaty provisions.

The Geneva Protocol of 1925 was the result of a League of Nations sponsored Conference for the Supervision of the International Trade in Arms and Ammunition and in Implements of War. The conference was called to attempt to provide some controls on international arms trade as a result of an arms buildup (primarily naval) between the US, Great Britain, and Japan following World War I. The agenda, however, did not include controls on chemical or biological weapons. The United States proposed a universal ban on the use of asphyxiating gases in warfare.⁷ However, after substantial discussion as to the role of the League of Nations in dictating the laws of war, the final version of the Protocol only prohibited "the use in war of asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices."⁸ The Protocol's impact was limited because of differing interpretation of what

chemicals were prohibited, reservations as to applicability, and territorial implications. The US, because of Senate opposition, did not ratify the Protocol until 1975. (The US reserved the right to respond in kind if first attacked with these weapons.) However, as stated by ^{Yossi Nahari} Thomas and

x Thomas:

The Geneva Protocol is the most significant international agreement banning the use of CB weapons, for it has been adhered to by a large number of states. Its broad proscription on chemical agents far exceeds the very restrictive prohibition of the Hague Gas Declaration. It is the only general treaty in effect expressly prohibiting bacteriological warfare.⁹

Note that since Thomas' research, the Biological and Toxin Weapons Convention of 1972 has been ratified.

The years preceding World War II saw no further progress in the control of chemical weapons. Chemical weapons were not used in World War II, although weapons were produced and stockpiled by most combatants, including the US. Hitler was opposed to use of gas, reportedly because he had been gassed in WWI. President Roosevelt publicly announced (1943) a no first use of CW. Churchill's advisors reasoned that high explosives were more effective than CW.¹⁰ The post-World War II era saw much discussion in the newly formed United Nations on how to control arms. Although much of the emphasis was on nuclear weapons, United Nations Secretary General Trygve Lie's 1948 report urged adoption of a chemical and biological treaty.¹¹ Little, however, was done in this regard. Several nations,

including the United States, stated that they considered the Geneva Protocol obsolete, essentially because of the lack of international controls, or, in other words, lack of verification.

Discussion of the issue of a chemical and biological weapons ban continued through the 1950s and 1960s in various United Nations fora. During this period, the use of herbicides by the US in Vietnam lead to much criticism from those, especially the USSR, who noted the US had failed to ratify the Geneva Protocol.

In 1969, the British submitted a draft convention on biological weapons.¹² After several years of discussion, negotiation, and compromise, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction was signed in April 1972, approved by the Senate in December 1974, and formally ratified by the President in January 1975. Articles I, II, and III of the Convention, in essence, state that: (1) each state will not develop, produce, stockpile, or otherwise acquire or retain biological agents, toxins, or associated delivery weapons; (2) each party will destroy their agents, toxins, and delivery weapons; and (3) each party would not transfer the prohibited items to another state.¹³ Biological agents were defined; however, verification procedures were not

specified. Adherence to the Convention depends solely on the good faith of each signatory.

The issue of chemical weapons was addressed in Article IX of the Convention in the following manner:

Each State Party to this Convention affirms the recognized objective of effective prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specifically designed for the production or use of chemical agents for weapons purposes.¹⁴

This, Convention served as the springboard for the present negotiations toward a CW ban.

CHAPTER III

NEGOTIATIONS: PAST AND PRESENT

Article IX of the Biological and Toxin Weapons Convention of 1972 set the stage for the initiation of bilateral discussions between the US and USSR on a chemical weapons ban. In 1974, President Richard Nixon and Leonid Brezhnev, General Secretary of the Communist Party of the Soviet Union, agreed to consider a chemical weapons ban. Initial meetings began in August 1976.¹ In 1977, bilateral working groups achieved some agreement on basic principles.² Negotiations, however, lapsed with the cooling of US-Soviet relations in 1979-80, following the Soviet invasion of Afghanistan.

Consideration of a multilateral ban on chemical weapons was thereafter added to the agenda of the United Nations Conference on Disarmament. The 40-member Conference, created in 1969, is a successor body to the 25-member Conference on the Committee on Disarmament, established in Geneva in 1960.³

In April, 1984, the US tabled a draft Chemical Weapons Convention, a draft which called for a comprehensive, global, effectively verifiable ban on chemical weapons. The US draft, CD/500, serves as the basis for the US Government's position in the negotiations and reflects the Reagan administration's insistence on stringent

verification provisions for all arms control treaties.

In this regard, CD/500 calls for an intrusive "anywhere-anytime" short notice inspection of sites where treaty violations are suspected.⁴

The USSR had refused to accept the on-site verification aspects of the draft convention until a seemingly dramatic change of policy in August, 1987. Only in 1987 did the Soviets acknowledge that they possessed chemical weapons, although they denied that they were currently producing these weapons.⁵ Then, on August 6, 1987, Soviet Foreign Minister Eduard Shevardnadze accepted the principle of challenge inspection. This position was elaborated by USSR CD Ambassador Youri Nazarkin in the CD plenary of August 11, 1987.⁶ In this author's opinion, and, as alluded to in the media,⁷ it was only after the USSR failed to derail the US chemical weapons modernization program ("binary" munitions) that the USSR has changed its policy to one of admitting to possession, if not production, of chemical weapons and accepting the principle of on-site inspection.

While new thresholds were crossed in 1987, many obstacles to a treaty remain. At the beginning of the Conference on Disarmament 1988 session, Ambassador Max L. Friedersdorf, US Representative to the Conference, stated that "of all the items on our agenda, clearly the item of most importance for . . . our work in the coming

weeks and months, is chemical weapons."⁸ Ambassador Friedersdorf cautioned, however, that serious issues are unresolved:

Whether challenge inspection should involve a right of refusal; how to verify the accuracy of declarations; how to monitor the chemical industry so as to ensure non-production; (how to guarantee) security during the destruction phase; (and), what production will be permitted where.⁹

Friedersdorf concluded by stressing that the US

remains committed to negotiation of a verifiable, comprehensive and effective international convention on the prohibition and destruction of chemical weapons encompassing all chemical weapons-capable states.¹⁰

The key issues of security and verification are essential to conclusion of an agreement to ban chemical weapons. These issues involve confidence--confidence in a clear understanding of what is being prohibited and a certainty of adequate verification measures.

CHAPTER IV

PROSPECTS FOR A CHEMICAL WEAPONS BAN

Current US policy is stated in ¹⁰⁻²Conference on Disarmament document (CD/500). The US position calls for a comprehensive, global, effectively verifiable international convention on the prohibition and destruction of chemical weapons.

The US position contains three key points that must be clearly understood. First, the ban must be comprehensive. That is, it must include all chemical weapons, chemical weapons delivery equipment, and production facilities. Second, the ban must be global, that is, including all nations that have chemical weapons or are capable of producing chemical weapons. Third, the ban must be effective, that is, must have verification measures to provide confidence that the ban is being complied with. Now let's examine the pluses and minuses of the current proposed convention.

The attempt to achieve a global ban on all chemical weapons is certainly laudable. A total ban is the best way to achieve complete confidence in the security of the signatory nations. On the minus side, however, the convention will not, in practice, be global, i.e., it is very doubtful that all chemical weapons possessing or chemical weapons capable states will sign the convention.

For examples of this difficulty, one needs only look to the Middle East. It is fair to assume that Egypt, Israel, and Syria possess or are capable of possessing chemical weapons. Israel is certainly not going to endorse a treaty banning chemical weapons while Syria possesses chemical weapons. The converse is true of Syria. It is worth noting that neither Israel nor Syria are members of the CD. Consequently, even if they did come to sign a treaty, they certainly would not be early signatories. Additionally, Egypt is not going to accede to a ban if Israel maintains possession of chemical weapons. Other examples are readily obvious, such as Iraq and Iran.

As viewed by an Arms Control and Disarmament Agency (ACDA) official, the senior US negotiator on the chemical weapons treaty, the objective of a chemical weapons ban should be to include all countries, i.e., a global ban. However, getting all chemical weapons possessing or capable countries to agree to such a ban is virtually impossible. The political situation of the Middle East countries is a case in point of why a global ban is not likely.¹

The second stumbling block is verification of a chemical weapons ban. In the words of the Senior OSD official involved in the Geneva negotiations, there is a general recognition that a CW treaty cannot be verified in any full sense of the term. States can easily hide

one or more large stockpiles of chemical weapons, or produce new ones without great difficulty.²

In effect, this view means that US security interests can be achieved only if there is complete confidence that all parties to the treaty are abiding by the ban and that adequate on-site verification can be effected. Not even the most intrusive verification provisions can provide such a level of confidence.

A contrasting view is that verification should be considered in terms of the acceptability of the risks we have to, or are willing to, assume in order to achieve the objective of banning chemical weapons.³ In other words, there could be a tradeoff between the desirability of achieving an agreement and the necessities of verification. Sufficiency may be the best word to sum this up. Verification can be viewed as a continuum from simply agreeing not to do something (1972 Biological Convention) to the most intrusive measures of inspection.

The Department of Defense publically favors the most stringent measures to guarantee compliance, but officials privately acknowledge that even intrusive measures will not be adequate. This point of view reflects that it is DOD that ultimately is held accountable for maintaining national security.⁴ Of note is the DOD view that the Soviets have violated the Biological and Toxin Weapons Convention (BWC) of 1972.

Although the BWC bans the development, production and stockpiling of biological agents and toxins for hostile purposes, we have observed no reduction in Soviet offensive BW activity. We have concluded that the Soviets have and are developing and producing BW agents. They are continuing to test and evaluate delivery and dissemination systems for these agents.⁵

*Don't know
security interests
view from political
subject lines*

In contrast, State Department and ACDA views, while seemingly keeping national security interests in the forefront, are oriented to achieve political agreements. Thus, the issues of sufficiency are more negotiable from the perspective of State/ACDA than from that of the DOD.

Given the realities that a ban on chemical weapons will be, at least for the immediate future, neither global nor verifiable, an alternative approach needs to be proposed. I recommend that the chemical weapons issue should be approached on the basis of a reduction vice a total ban. A reduction in chemical weapons is achievable and eliminates some security and political obstacles associated with a global, effectively verifiable ban.

France has proposed that each participating nation reduce the amount of chemical weapons that they possess but that each nation be allowed to maintain a minimum stockpile for national security. This security stockpile not only includes weapons but also provides for the maintenance of one production facility. This concept should be embraced and supported. In keeping with the spirit and intent of arms control, a reduction in chemical weapons, if not a total ban, is indeed a laudable,

progressive first step. The ultimate, if distant, goal should remain that of achieving a comprehensive, global, effectively verifiable ban on chemical weapons. However, this proposal could be modified to make it a more effective treaty based on the realities of how nations will possess and use chemical weapons as a deterrent. The French proposal suggests that each nation be allowed to maintain chemical weapons and a production facility in a secret location of its choice. I would propose that chemical weapons storage and production facilities be declared publicly and, for purposes of verification, be made accessible to inspectors of an international inspectorate. By so doing each country will have achieved security confidence by being able to advertise to any potential adversary their retaliatory capability.

The French proposal buttresses the concept of deterrence. Although chemical warfare is generally viewed as abhorrent, in the absence of achieving a global, effectively verifiable ban on chemical weapons, maintenance of a deterrent capability is essential to provide national security. The very knowledge that a potential adversary possesses a chemical weapons capability serves to deter any thoughts of "first use," given that retaliation in kind will be likely. The argument is sometimes offered that use of chemical weapons does not have to be responded to in kind. Retaliation against a chemical weapons attack could, for

example, be countered with a (theater) nuclear response. However, this presupposes that the threshold for use of chemical and nuclear weapons is the same. The threshold for use of nuclear weapons is, however, higher than that of use of chemical weapons. This proposed nuclear retaliatory response is, in fact, asymmetrical and, therefore, not a deterrent to the use of chemical weapons. At least for the foreseeable future, a deterrent stockpile of chemical weapons and an adequate production facility must be maintained in order to ensure that the US is able to retaliate in kind to a chemical attack. This security stockpile need not be tremendously large, but must be modern and effective. In order to enhance deterrence, the security stockpile should be well "advertised" to discourage other states from even considering use of chemical weapons against US forces.

An effective security stockpile must also be a modern one. The production of binary chemical weapons, which will eventually replace the aged unitary stocks, has been approved by Congress and certified as viable by the President. The production of 155mm artillery shells, which has already begun, and the future production of the Bigeye Bomb will provide the US with a small, but reliable, stockpile of chemical weapons.

Agreement on a chemical weapons ban is a noble but very distant goal. In the near term, there must be a transition period during which chemical weapons can be greatly reduced in numbers. It is essential, however, that during this transition period the national security interests of affected nations be maintained. Without that security confidence, real or perceived vulnerabilities would lead to destabilizing behavior. Security stockpiles, under international supervision, will compensate for both the contingency that some states with chemical weapons will not sign the convention and the realization that no system of verification is adequate to ensure that cheating will be promptly and unequivocally detected.

CHAPTER V

CONCLUSION

A prohibition of chemical weapons has been a goal for a very long time. A ban on chemical weapons is certainly a laudable objective. Use of this type of weapons has long been abhorrent to most world political states. After many years of little progress, the US initiative in the form of CD/500 was a significant approach towards achieving a total global ban on the production, stockpiling, and use of chemical weapons while ensuring national security concerns through intrusive, on-site verification measures. The US proposal has not been accepted by all. The proceedings in the current CD negotiations have produced varying texts reflecting different nations' concerns and positions. However, the likelihood of an agreed upon text emerging from the CD negotiations is extremely remote. The present approach to a comprehensive, global, effectively verifiable ban on CW will not be achievable. A different approach should be closely examined.

The different approach should be one of CW reduction vice CW elimination, at least for the near term. The French proposal of a CW security stockpile should be adopted, with modifications. These modifications,

allowance for international inspection, would provide for a degree of verification. Maintenance of limited, modern CW weapons and production facilities overcomes the interim security concerns. Existence of a limited, well-verified security stockpile would serve as a deterrent to first use by an opponent. National security dictates that a deterrent factor exist in a situation where a comprehensive, global, effectively verifiable ban cannot be achieved in the near term. While the ultimate goal should remain the total elimination of CW weapons, CW weapons reduction is a great step forward. Arms control, after all, includes reduction of arms as well as elimination of arms.

Ambassador Friedersdorf succinctly summed this point up in his comments at the opening of this CD session.

". . . there is no inconsistency in seeking the ultimate elimination of all chemical weapons while, in the interim, insisting upon the preservation of national security."¹

NOTES

CHAPTER II (Pages 3-7)

1. Ann Van Wynen Thomas & A. J. Thomas, Jr., Legal Limits On The Use of Chemical And Biological Weapons, (Dallas, Texas: Southern Methodist University Press, 1970), p. 43.
2. Thomas & Thomas, Legal Limits, p. 44.
3. Thomas & Thomas, Legal Limits, p. 46.
4. Thomas & Thomas, Legal Limits, p. 46.
5. Thomas & Thomas, Legal Limits, p. 49.
6. Thomas & Thomas, Legal Limits, p. 59.
7. Thomas & Thomas, Legal Limits, p. 71.
8. Thomas & Thomas, Legal Limits, p. 74.
9. Thomas & Thomas, Legal Limits, p. 73.
10. "Chemical Weapons Convention: Major Progress and Remaining Problems/Recent Progress Toward Chemical Disarmament" (F.A.S. Public Interest Report), Current News, Special Edition, No. 1687, 4 Feb. 88, p. 31.
11. Thomas & Thomas, Legal Limits, p. 105.
12. Thomas & Thomas, Legal Limits, p. 113.
13. Defense Intelligence Agency, Soviet Biological Warfare Threat (1986), p. 19.
14. Defense Intelligence Agency, Soviet Biological Warfare, p. 21.

CHAPTER III (Pages 8-10)

1. "Chemical Weapons Convention: Major Progress and Remaining Problems/Recent Progress Toward Chemical Disarmament" (F.A.S. Public Interest Report), Current News, Special Edition, No. 1687, 4 Feb. 88, p. 24.

2. "Chemical Weapons Convention," p. 24.

3. "Chemical Weapons Convention," p. 24.

4. Conference on Disarmament Document CD/500, 18 April 1984, "United States of America Draft Convention on the Prohibition of Chemical Weapons."

5. "The Move to Ban Chemical Weapons: Big Strides and Many More Hurdles (New York Times), Current News, Special Edition, No. 1687, 4 February, 1988, p. 11.

6. Statement by Youri K. Nazarkin, Ambassador Extraordinary and Plenipotentiary, USSR Representative To The Conference on Disarmament, August 11, 1987, p.1.

7. "Army Begins Producing Chemical Weapons, Ending 18-Year Moratorium," The Washington Post, 17 December, 1987, p. 36.

8. Statement by Ambassador Max L. Friedersdorf, United States Representative to the Conference on Disarmament, Geneva, February 2, 1988, p. 11.

9. Statement by Ambassador Max L. Friedersdorf, p. 20.

10. Statement by Ambassador Max L. Friedersdorf, p. 22.

CHAPTER IV (Pages 11-17)

1. Dr. Robert Mikulak, Arms Control and Disarmament Agency (author's interview).

2. Dr. Ronald R. Nelson, Secretary of Defense Representative to the United Nations Conference on Disarmament--Geneva (author's interview).

3. Dr. Robert Mikulak (interview).

4. Dr. Ronald R. Nelson (interview).

5. Defense Intelligence Agency, "Soviet Biological Warfare Threat," DST-1610F-057-86, 1986, p. 1.

CHAPTER V (Pages 18-19)

1. Statement by Max L. Friedersdorf, p. 19.

BIBLIOGRAPHY

"Army Begins Producing Chemical Weapons, Ending 18-Year Moratorium." The Washington Post, 17 December 1987.

"Chemical Weapons Convention: Major Progress and Remaining Problems/Recent Progress Toward Chemical Disarmament." Current News, Special Edition, No. 1687, 4 February 1988.

Conference on Disarmament Document CD/500, 18 April 1984, "United States of America Draft Convention on the Prohibition of Chemical Weapons."

Defense Intelligence Agency, "Soviet Biological Warfare Threat," DST-1610F-057-86, 1986, p. 1.

Friedersdorf, Max L. United States Representative to the Conference on Disarmament, Geneva. Statement, 2 February, 1988.

Mikulak, Dr. Robert. Interview, 11 February 1988.

Nazarkin, Youri K. USSR Representative to the Conference on Disarmament, Geneva. Statement, 11 August, 1987.

Nelson, Dr. Ronald R. Secretary of Defense Representative to the United Nations Conference on Disarmament, Geneva. Interview, December, 1987.

"The Move to Ban Chemical Weapons: Big Strides and Many More Hurdles." Current News, Special Edition, No. 1687, 4 February 1988.

Thomas, Ann Van Wynen and A. J. Thomas, Jr. Legal Limits on the Use of Chemical and Biological Weapons. Dallas, Texas: Southern Methodist University Press, 1970.